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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,324	10/16/2003	Robert Urscheler	62733C	7328

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THE DOW CHEMICAL COMPANY
INTELLECTUAL PROPERTY SECTION,
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EXAMINER	
BAREFORD, KATHERINE A	
ART UNIT	PAPER NUMBER
1762	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/05/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

C

Office Action Summary	Application No.	Applicant(s)	
	10/687,324	URSCHELER ET AL.	
	Examiner	Art Unit	
	Katherine A. Bareford	1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 December 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-47* is/are pending in the application.

4a) Of the above claim(s) *32-33* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-22,24,25,27,29-31,34,35 and 37-47* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

claims 2, 23, 26, 28 and 36 are canceled

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on December 15, 2006 has been entered.

The amendment filed December 15, 2006 with the RCE submission has been entered. With the entry of the amendment, claims 2, 23, 26, 28 and 36 are canceled, claims 32-33 are withdrawn, and claims 1, 3-~~23~~ 22, 24, 25, 27, 29-31, 34, 35 and 37-47 are pending for examination.

Priority

2. Priority in the present application as to the use of EP 1249533 only extends back to 10/17/02, the filing date of 10/273,922. A review of 10/257,172 indicates that it does not teach all the features in the independent claims of the present application, and thus, priority fails.

Claims

3. The Examiner understands the term "interface layer" as in claims 1 and 35 to refer to "the layer which comes in contact with the substrate to be coated" as defined at page 8 of the specification.

Claim Rejections - 35 USC § 112

4. The rejection of claim 39 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention is withdrawn due to applicant's amendment to claim 39 of December 15, 2006 to clarify the claim language.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1, 3-6, 8-22, 24, 25, 27, 29-31, 34, 35, 37 and 42-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 01/54828 (hereinafter '828) in view of Wittosch et al (US 6548120) and Katagiri et al (US 2002/0160121).

Claims 1, 35: '828 teaches a method of producing a coated substrate. Figure 2 and page 8. The steps include forming a composite, multilayer free flowing curtain. Figure 2 and page 8. The curtain comprises at least two layers. Page 2. At least one or more layer can provide barrier properties. Page 2. One layer can be provided with a material that provides water resistance functionality. Page 2. A layer can also provide oxygen barrier functionality. Page 2. The curtain is contacted with a continuous moving web. Figure 2 and page 8. The web can be basepaper. Page 4. The method can be used to make packages, such as food and drink packages. Page 7.

Claim 6: the oxygen transmission can be no more than 150 cm3/m2, per 24 h (23 degrees C, 83% relative humidity) at one atm, and most preferably no more than 1 cm3/m2. pages 6-7.

Claim 8: it is desired to prevent cracks. Pages 4-5.

Claims 14-17: 5-8 layers can be applied. Page 8.

Claim 20: the barrier layer can include polyvinyl alcohol. Page 2.

Claim 22: the layers can include a surfactant. Page 4.

Claim 34: additional adhesive layer can be applied. Page 2.

Claim 37: the curtain can be formed with a slide die. Figure 2 and page 8.

'828 teaches all the features of these claims except for (1) the combination of different layer materials, (2) the Cobb value features (claims 1, 5), (3) the oil/grease features (claims 1, 3), (4) the water vapor transmission (claims 1, 4), (5) the oxygen barrier features (claims 1, 6), (6) the coat weight (claims 9-13), (7) the pigments and printablity (claims 1, 18-19, 35), (8) the components of claim 21, (9) the solid contents (claims 1, 24-25), (10) the paper features (claim 27), (11) the web speed (claims 29,30, 35, 42-44), (12) the web weight (claim 31) and (13) the viscosity of the interface layer (claims 1, 35).

However, Wittosch teaches layer materials desired to be applied as part of a multilayer coating to paper webs. The basis weight of the substrate paper can be 20 to 150 lbs/ft2 (30-244 g/m2). Column 6, lines 40-50. The substrate can be uncoated paper and paperboard. Column 6, lines 40-45. Wittosch teaches that it is desired to provide grease resistant layers. Column 7, lines 30-35 and column 10, line 15 through column 11, line 35. The grease Kit value can be 11-12: column 11, lines 15-25 and column 7, lines 60-68. It is also desirable to provide water vapor barrier functionality and water resistance functionality. Column 7, lines 30-60. The water vapor transmission rate can be less than 2.38 g/100 sq.inches in a day (about 37 g/m2). Column 9, lines 10-20. The Cobb test for water resistance can be 0.99-.58 g/100 sq.inches in 30 min (about 15-9 g/m2). Column 11, lines 15-25. The layers can include polyvinyl chloride. Column 5, lines 20-30. Wittosch teaches that the layers can be applied by curtain coating. column 6, lines 55-60. The layers can all be over 40 % solids. See column 8, lines 1-10. They can

all be over 50 % solids. Column 8, lines 45-55. Wittosch teaches that the solids content in each layer should be preferably 40-55%. Column 5, lines 25-35. The Examiner understands this solids content to be referring to wt% as this is the conventional format for such description of solid contents. The viscosity of the layers can include 250-450 cps layers and 40-75 cps layers. Column 7, lines 5-10.

Katagiri teaches a curtain coating process where a multilayer coating is applied to a running web. Paragraph [0002] and figure 1. The lowermost layer (interface layer) can have a viscosity of 150 mPas (=centipoises). Paragraph [0039], [0042] and Table 1 (see examples 1-6). When coating with this lowermost layer of 150 mPas, acceptable coatings can be produced at 300 m/min, 400 m/min and 500 m/min (see example 5).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify '828 to further include functional layers that provide grease and/or water vapor barrier functionality and other paper features as described by Wittosch in order to provide a desirable final paper for commercial use, because '828 teaches to include one or more layers that have functional barrier properties, including moisture resistance and oxygen barrier functionality and Wittosch teaches that it is desirable to provide layers that provide grease resistance and water vapor functionality when providing commercial paper. It would further have been obvious to provide the different functional features in separate layers, given '828's teaching that multiple functional layers can be provided. As to the specific water vapor transmission amounts, oxygen transmission, the Cobb values, and the Kit values, '828 and Wittosch

teach that these are important values to control in the area of that claimed by applicant, and one of ordinary skill in the art would perform routine experimentation to optimize the specific values of these desirable features. As to the use of pigments and a printable layer, it is the Examiner's position that it would have been obvious to use well known pigments in the layers and to make printable, given that '828 teaches, for example, that food and drink packages can be made, which packages are well known to be printed and provided with color for consumer use. As to the coatweight, it would have been obvious to perform routine experimentation to optimize these features based on the functional features desired, given the teaching of '828 to provide multiple extremely thin layers and the number of functional layer features that are taught to be possibly provided. As to the components of claim 21, Wittosch teaches that polyvinyl chloride, for example, is a desirable ingredient in the coating layers. As to the use of non-precoated papers, Wittosch teaches the desire to coat and protect such papers. As to the web weight, Wittosch teaches the desire to coat and protect papers of such weight. It further would have been obvious to modify '828 in view of Wittosch to further use a lowermost (interface) layer of 150 cP and a web speed of greater than 200 m/min and up to 500 m/min, as suggested by Katagiri with an expectation of providing a desirably speedy coating, because '828 in view of Wittosch teaches the desire to curtain coat moving webs and Katagiri teaches that when curtain coating a desirable multilayer curtain can be provided using a lowermost viscosity layer of 150 cP and a web speed of greater than 200 m/min to 500 m/min. As to the solids content, it would have been

obvious to use solid contents as taught by Wittosch with an expectation of similar results, given that Wittosch teaches that the layer materials provided can be applied by curtain coating. This would provide that each layer of the curtain can be greater than 45 wt% solids, as Wittosch provides that each layer material can be greater than 45 wt% solids. One of ordinary skill in the art would clearly expect that multilayer curtains can be provided of these materials, because their viscosities overlap with the acceptable viscosities given by Katagiri.

8. Claims 1, 3-6, 8-22, 24, 25, 27, 31, 34, 35, 37 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 01/54828 (hereinafter '828) in view of Wittosch et al (US 6548120) and Japan 2000-070810 (hereinafter '810).

Claims 1, 35: '828 teaches a method of producing a coated substrate. Figure 2 and page 8. The steps include forming a composite, multilayer free flowing curtain. Figure 2 and page 8. The curtain comprises at least two layers. Page 2. At least one or more layer can provide barrier properties. Page 2. One layer can be provided with a material that provides water resistance functionality. Page 2. A layer can also provide oxygen barrier functionality. Page 2. The curtain is contacted with a continuous moving web. Figure 2 and page 8. The web can be basepaper. Page 4. The method can be used to make packages, such as food and drink packages. Page 7.

Claim 6: the oxygen transmission can be no more than 150 cm3/m2, per 24 h (23 degrees C, 83% relative humidity) at one atm, and most preferably no more than 1 cm3/m2. pages 6-7.

Claim 8: it is desired to prevent cracks. Pages 4-5.

Claims 14-17: 5-8 layers can be applied. Page 8.

Claim 20: the barrier layer can include polyvinyl alcohol. Page 2.

Claim 22: the layers can include a surfactant. Page 4.

Claim 34: additional adhesive layer can be applied. Page 2.

Claim 37: the curtain can be formed with a slide die. Figure 2 and page 8.

'828 teaches all the features of these claims except for (1) the combination of different layer materials, (2) the Cobb value features (claims 1, 5), (3) the oil/grease features (claims 1, 3), (4) the water vapor transmission (claims 1, 4), (5) the oxygen barrier features (claims 1, 6), (6) the coat weight (claims 9-13), (7) the pigments and printablity (claims 1, 18-19, 35), (8) the components of claim 21, (9) the solid contents (claims 1, 24-25), (10) the paper features (claim 27), (11) the web speed (claims 35, 42), (12) the web weight (claim 31) and (13) the viscosity of the interface layer (claims 1, 35).

However, Wittosch teaches layer materials desired to be applied as part of a multilayer coating to paper webs. The basis weight of the substrate paper can be 20 to 150 lbs/ft2 (30-244 g/m2). Column 6, lines 40-50. The substrate can be uncoated paper and paperboard. Column 6, lines 40-45. Wittosch teaches that it is desired to provide grease resistant layers. Column 7, lines 30-35 and column 10, line 15 through column 11,

line 35. The grease Kit value can be 11-12. column 11, lines 15-25 and column 7, lines 60-68. It is also desirable to provide water vapor barrier functionality and water resistance functionality. Column 7, lines 30-60. The water vapor transmission rate can be less than 2.38 g/100 sq.inches in a day (about 37 g/m2). Column 9, lines 10-20. The Cobb test for water resistance can be 0.99-.58 g/100 sq.inches in 30 min (about 15-9 g/m2). Column 11, lines 15-25. The layers can include polyvinyl chloride. Column 5, lines 20-30. Wittosch teaches that the layers can be applied by curtain coating. column 6, lines 55-60. The layers can all be over 40 % solids. See column 8, lines 1-10. They can all be over 50 % solids. Column 8, lines 45-55. Wittosch teaches that the solids content in each layer should be preferably 40-55%. Column 5, lines 25-35. The Examiner understands this solids content to be referring to wt% as this is the conventional format for such description of solid contents. The viscosity of the layers can include 250-450 cps layers and 40-75 cps layers. Column 7, lines 5-10.

'810 teaches a curtain coating process where a multilayer coating is applied to a running web. See the abstract and figure 1. The lowermost layer (interface layer) can have a viscosity of 50-300 cP. See the abstract. The speed of the web is tested at 230 m/min, for example. See paragraph [0094].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify '828 to further include functional layers that provide grease and/or water vapor barrier functionality and other paper features as described by Wittosch in order to provide a desirable final paper for commercial use, because '828

teaches to include one or more layers that have functional barrier properties, including moisture resistance and oxygen barrier functionality and Wittosch teaches that it is desirable to provide layers that provide grease resistance and water vapor functionality when providing commercial paper. It would further have been obvious to provide the different functional features in separate layers, given '828's teaching that multiple functional layers can be provided. As to the specific water vapor transmission amounts, oxygen transmission, the Cobb values, and the Kit values, '828 and Wittosch teach that these are important values to control in the area of that claimed by applicant, and one of ordinary skill in the art would perform routine experimentation to optimize the specific values of these desirable features. As to the use of pigments and a printable layer, it is the Examiner's position that it would have been obvious to use well known pigments in the layers and to make printable, given that '828 teaches, for example, that food and drink packages can be made, which packages are well known to be printed and provided with color for consumer use. As to the coatweight, it would have been obvious to perform routine experimentation to optimize these features based on the functional features desired, given the teaching of '828 to provide multiple extremely thin layers and the number of functional layer features that are taught to be possibly provided. As to the components of claim 21, Wittosch teaches that polyvinyl chloride, for example, is a desirable ingredient in the coating layers. As to the use of non-precoated papers, Wittosch teaches the desire to coat and protect such papers. As to the web weight, Wittosch teaches the desire to coat and protect papers of such weight. It

further would have been obvious to modify '828 in view of Wittosch to further use a lowermost (interface) layer of, for example 300 cP and a web speed of greater than 200 m/min, as suggested by '810 with an expectation of providing a desirably speedy coating, because '828 in view of Wittosch teaches the desire to curtain coat moving webs and '810 teaches that when curtain coating a desirable multilayer curtain can be provided using a lowermost viscosity layer of 50-300 cP and a web speed of greater than 200 m/min. As to the solids content, it would have been obvious to use solid contents as taught by Wittosch with an expectation of similar results, given that Wittosch teaches that the layer materials provided can be applied by curtain coating. This would provide that each layer of the curtain can be greater than 45 wt% solids, as Wittosch provides that each layer material can be greater than 45 wt% solids. One of ordinary skill in the art would clearly expect that multilayer curtains can be provided of these materials, because their viscosities overlap with the acceptable viscosities given by '810.

9. Claims 29-30 and 43-44 are rejected under 35 U.S.C. 103(a) as being unpatentable '828 in view of Wittosch and '810 as applied to claims 1, 3-6, 8-22, 24, 25, 27, 31, 34, 35, 37 and 42 above, and further in view of Japan 2000-045200 (hereinafter '200).

'828 in view of Wittosch and '810 teach all the features of these claims except a web speed of at least 400 m/min or 500 m/min.

However, '200 teaches a method of curtain coating onto a moving web using a coating with a solid content of 55-70 wt%. See the abstract. '200 teaches that coatings can be performed with such solids content at a web speed of 1300 m/min. See paragraphs [0026] – [0034] and Table 1.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify '828 in view of Wittosch and '810 to use a web speed of greater than 400 m/min or 500 m/min as described by '200 in order to provide a desirable rapid coating process, because '828 in view of Wittosch and '810 teaches to curtain coat using a high solids content, and '200 teaches that when curtain coating with solids content of 55-70 wt% it is known to have web speeds as fast as 1300 m/min.

10. Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over '828 in view of Wittosch and Katagiri or '828 in view of Wittosch and '810 as applied to claims 1, 3-6, 8-22, 24, 25, 27, 29-31, 34, 35, 37 and 42-44/1, 3-6, 8-22, 24, 25, 27, 31, 34, 35, 37 and 42, respectively, above, and further in view of the abstract of DD 221722 (hereinafter '722).

'828 in view of Wittosch and Katagiri / '828 in view of Wittosch and '810 teaches all the features of this claim except use of synthetic magadiite as a pigment.

However, '722 teaches a desirable method of synthesizing magadiite, thus forming synthetic magadiite. Abstract. The produced material can be used as pigment. Abstract.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify '828 in view of Wittosch and Katagiri / '828 in view of Wittosch and '810 to use a pigment of synthetic magadiite as described by '722 in order to provide a desirable final paper for commercial use, because '828 in view of Wittosch and Katagiri / '828 in view of Wittosch and '810 teaches to include one or more layers that have functional barrier properties and to use a pigmented coating, and '722 teaches that a known pigment that can be synthesized is magadiite.

11. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over '828 in view of Wittosch and Katagiri or '828 in view of Wittosch and '810 as applied to claims 1, 3-6, 8-22, 24, 25, 27, 29-31, 34, 35, 37 and 42-44/1, 3-6, 8-22, 24, 25, 27, 31, 34, 35, 37 and 42, respectively, above, and further in view of Hughes (US 3508947)

'828 in view of Wittosch and Katagiri / '828 in view of Wittosch and '810 teaches all the features of this claim except formation of a curtain with a slot die.

However, Hughes teaches that when curtain coating, it is well known to use a slide die (figure 1) or a slot type die (figure 8) to provide the free falling multilayer curtain. Column 8, lines 10-45.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify '828 in view of Wittosch and Katagiri / '828 in view of Wittosch and '810 to use a slot die as described by Hughes in order to provide a desirable final paper for commercial use, because '828 in view of Wittosch and Katagiri

/ '828 in view of Wittosch and '810 teaches to use a slide curtain coating die system, and Hughes teaches that it is desirable to curtain coat with either a slot or slide die system.

12. Claims 38, 39, 41 and 45-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over '828 in view of Wittosch and Katagiri as applied to claims 1, 3-6, 8-22, 24, 25, 27, 29-31, 34, 35, 37 and 42-44 above, and further in view of Dittman et al (US 4001024).

'828 in view of Wittosch and Katagiri teaches all the features of these claims except the provision of polyethylene oxide in a layer. '828 does teach the use of a surfactant in the coating layers. See page 8.

However, Dittman teaches that a well known surfactant to use when forming multilayer coating layers on slide die systems is polyethylene oxide. See column 7, lines 55-65.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify '828 in view of Wittosch and Katagiri to further use a surfactant such as polyethylene oxide as described by Dittman in order to provide a desirable final paper for commercial use, because '828 in view of Wittosch and Katagiri teaches to include a surfactant in the layers, and Dittman teaches that a well known surfactant for multilayer coatings on slide dies is polyethylene oxide. As to the interface layer, '828 indicates that surfactants can be in the various layers.

13. Claims 38, 39, 41 and 46-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over '828 in view of Wittosch and '810 as applied to claims 1, 3-6, 8-22, 24, 25, 27, 31, 34, 35, 37 and 42 above, and further in view of Dittman et al (US 4001024).

'828 in view of Wittosch and '810 teaches all the features of these claims except the provision of polyethylene oxide in a layer. '828 does teach the use of a surfactant in the coating layers. See page 8.

However, Dittman teaches that a well known surfactant to use when forming multilayer coating layers on slide die systems is polyethylene oxide. See column 7, lines 55-65.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify '828 in view of Wittosch and '810 to further use a surfactant such as polyethylene oxide as described by Dittman in order to provide a desirable final paper for commercial use, because '828 in view of Wittosch and '810 teaches to include a surfactant in the layers, and Dittman teaches that a well known surfactant for multilayer coatings on slide dies is polyethylene oxide. As to the interface layer, '828 indicates that surfactants can be in the various layers.

14. Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable '828 in view of Wittosch, '810 and Dittman as applied to claims 38, 39, 41 and 46-47 above, and further in view of Japan 2000-045200 (hereinafter '200).

'828 in view of Wittosch, '810 and Dittman teach all the features of this claim except a web speed of at least 400 m/min.

However, '200 teaches a method of curtain coating onto a moving web using a coating with a solid content of 55-70 wt%. See the abstract. '200 teaches that coatings can be performed with such solids content at a web speed of 1300 m/min. See paragraphs [0026]—[0034] and Table 1.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify '828 in view of Wittosch , '810 and Dittman to use a web speed of greater than 400 m/min as described by '200 in order to provide a desirable rapid coating process, because '828 in view of Wittosch, '810 and Dittman teaches to curtain coat using a high solids content, and '200 teaches that when curtain coating with solids content of 55-70 wt% it is known to have web speeds as fast as 1300 m/min.

15. Claims 41 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 01/54828 (hereinafter '828) in view of Wittosch et al (US 6548120), WO 92/11095 (hereinafter '095) and Dittman (US 4001024).

'828 teaches a method of producing a coated substrate. Figure 2 and page 8. The steps include forming a composite, multilayer free flowing curtain. Figure 2 and page 8. The curtain comprises at least two layers. Page 2. At least one or more layer can provide barrier properties. Page 2. One layer can be provided with a material that provides water resistance functionality. Page 2. A layer can also provide oxygen

barrier functionality. Page 2. The curtain is contacted with a continuous moving web. Figure 2 and page 8. The oxygen transmission can be no more than 150 cm3/m2, per 24 h (23 degrees C, 83% relative humidity) at one atm, and most preferably no more than 1 cm3/m2. pages 6-7. The layers can include a surfactant. Page 4. The web can be basepaper. Page 4. The method can be used to make packages, such as food and drink packages. Page 7.

'828 teaches all the features of these claims except for (1) the combination of different layer materials, (2) the Cobb value features, (3) the oil/grease features, (4) the water vapor transmission, (5) the oxygen barrier features, (6) the coat weight, (7) the solid contents, (8) the web speed (claims 41, 45), (9) the provision of polyethylene oxide in a layer, and (10) the printability (claim 41).

However, Wittosch teaches layer materials desired to be applied as part of a multilayer coating to paper webs. The basis weight of the substrate paper can be 20 to 150 lbs/ft2 (30-244 g/m2). Column 6, lines 40-50. The substrate can be uncoated paper and paperboard. Column 6, lines 40-45. Wittosch teaches that it is desired to provide grease resistant layers. Column 7, lines 30-35 and column 10, line 15 through column 11, line 35. The grease Kit value can be 11-12. column 11, lines 15-25 and column 7, lines 60-68. It is also desirable to provide water vapor barrier functionality and water resistance functionality. Column 7, lines 30-60. The water vapor transmission rate can be less than 2.38 g/100 sq.inches in a day (about 37 g/m2). Column 9, lines 10-20. The Cobb test for water resistance can be 0.99-.58 g/100 sq.inches in 30 min (about 15-9

g/m2). Column 11, lines 15-25. The layers can include polyvinyl chloride. Column 5, lines 20-30. Wittosch teaches that the layers can be applied by curtain coating. column 6, lines 55-60. The layers can all be over 40 % solids. See column 8, lines 1-10. They can all be over 50 % solids. Column 8, lines 45-55. Wittosch teaches that the solids content in each layer should be preferably 40-55%. Column 5, lines 25-35. The Examiner understands this solids content to be referring to wt% as this is the conventional format for such description of solid contents. The viscosity of the layers can include 250-450 cps layers and 40-75 cps layers. Column 7, lines 5-10.

'095 teaches curtain coating processes. Page 1, lines 1-5. '095 teaches that for economic reasons, high coating speeds are desirable provided they can be achieved with low waste and without loss of product quality. Page 1, lines 20-30. '095 teaches that high coating speeds are possible by using a low viscosity bottom layer. Page 1, lines 35-35. The curtain coating can be multilayer curtain coating. page 6, line 30 through page 7, line 10 and figures 1 and 4. Uniform coatings can be achieved with speeds up to 738 m/min ($mmin^{-1}$). Page 11, lines 5-25.

Dittman teaches that a well known surfactant to use when forming multilayer coating layers on slide die systems is polyethylene oxide. See column 7, lines 55-65.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify '828 to further include functional layers that provide grease and/or water vapor barrier functionality and other paper features as described by Wittosch in order to provide a desirable final paper for commercial use, because '828

teaches to include one or more layers that have functional barrier properties, including moisture resistance and oxygen barrier functionality and Wittosch teaches that it is desirable to provide layers that provide grease resistance and water vapor functionality when providing commercial paper. It would further have been obvious to provide the different functional features in separate layers, given '828's teaching that multiple functional layers can be provided. As to the specific water vapor transmission amounts, oxygen transmission, the Cobb values, and the Kit values, '828 and Wittosch teach that these are important values to control in the area of that claimed by applicant, and one of ordinary skill in the art would perform routine experimentation to optimize the specific values of these desirable features. As to the coatweight, it would have been obvious to perform routine experimentation to optimize these features based on the functional features desired, given the teaching of '828 to provide multiple extremely thin layers and the number of functional layer features that are taught to be possibly provided. As to the solids content, it would have been obvious to use solid contents as taught by Wittosch with an expectation of similar results, given that Wittosch teaches that the layer materials provided can be applied by curtain coating. This would provide that each layer of the curtain can be greater than 45 wt% solids, as Wittosch provides that each layer material can be greater than 45 wt% solids. It further would have been obvious to modify '828 in view of Wittosch to further use as high a web velocity (coating speed) as possible, including up to 738 m/min, as suggested by '095 with an expectation of providing a desirably economically efficient coating, because '828 in view

of Wittosch teaches the desire to curtain coat moving webs and '828 notes that a bottom low viscosity layer can be provided (page 4, lines 5-15) and '095 teaches that when curtain coating it is desirable to increase the coating speed to as high as possible, including to 738 m/min, for economic reasons by a process that uses a low viscosity bottom layer. It would further have been obvious to one of ordinary skill in the art at the time the invention was made to modify '828 in view of Wittosch and '095 to further use a surfactant such as polyethylene oxide as described by Dittman in order to provide a desirable final paper for commercial use, because '828 in view of Wittosch and '095 teaches to include a surfactant in the layers, and Dittman teaches that a well known surfactant for multilayer coatings on slide dies is polyethylene oxide. As to the interface layer, '828 indicates that surfactants can be in the various layers. As to the use of a printable layer, it is the Examiner's position that it would have been obvious to make the top layer printable, given that '828 teaches, for example, that food and drink packages can be made, which packages are well known to be printed and provided with color for consumer use.

Response to Arguments

16. Applicant's arguments filed December 15, 2006 have been fully considered but they are not persuasive.

(A) As to applicant's arguments as to the rejections of claims 1, 3-6, 8-22, 24, 25, 27, 29-31, 34, 35, 37 and 42-44 using '828 in view of Wittosch (the Examiner notes that

Wittosch is US 6548120, not '129) and Katagiri, the Examiner has reviewed applicant's arguments at pages 9-13 of the amendment, however, the rejection is maintained. (1) As to the argument that the reference do not contain any teachings that would motivate one of ordinary skill in the art to combine, the Examiner notes that both '828 and Wittosch are in the general field of paper coating, both teach the use of curtain coating, and moreover, both indicate the making of layered packaging articles, see page 7 of '828 and column 3, lines 55-60 of Wittosch, thus indicating that they are directed to analogous art. As well, while Katagiri refers to the photographic art, it also specifically refers to coatings on paper [0026] and that the coating liquids can be used in the non-photographic art, such as to make thermal recording paper and ink jet paper. Moreover, no requirement is made as to the solids content in the coatings. As a result, it is directed to the general curtain coating of paper webs and demonstrates desirable forms of coating such paper webs and thus is of analogous art to the other references. As to the motivation to combine, the Examiner has clearly stated the motivations to combine the references and the benefits to be achieved. (2) In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*,

443 F.2d 1392, 170 USPQ 209 (CCPA 1971). Here, in the rejection above, knowledge outside of applicant's disclosure has been cited. As to the argument of picking and choosing from conflicting teachings, '828 teaches at page 4 that the viscosity of the fluid layers "may be controlled as known in the art" and that "Generally, in slide coating the bottom layer should have a low viscosity", which is an optional teaching and the reference would not teach away from using a different application method. Furthermore, the teaching in '828 at page 4 as to using "low viscosity, preferably of 50 mPas or less" does not mean that it teaches away from the lowermost layer of 150 cP taught by Katagiri. "Low viscosity" is specifically not limited to below 50 mPas. The lowermost layer of Katagiri is "low viscosity" as compared to using layer viscosities of 300 mPas or more on an upper layer. While '828 may prefer below 50 mPas, as discussed in MPEP 2123, "Disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments. In re Susi, 440 F.2d 442, 169 USPQ 423 (CCPA 1971)." While Katagiri may have provided an example where stable curtain could not be formed where the viscosity of the interface layer was 350 mPas, the present claim only requires a viscosity above 100 cP, which is provided by Katagiri. Similarly Katagiri does not teach that the second layer must have a second layer viscosity of 300 or more mPas, see Example 2, Table 1. Furthermore, the viscosities of above layers being greater than 300 mPas is not prevented by the present claims. As to the solids content of the curtain and the multilayer curtain, while '828 at page 5 may indicate a preference of 5-25%, this is an

option, not a requirement and as discussed above with regard to MPEP 2123 is not a teaching away from a broader disclosure. The Examiner has cited Wittosch as showing the known use of the claimed solids content in curtain coating, and the overlap of the viscosities of Wittosch with the acceptable viscosities for use in multilayer curtain coating shown by Katagiri clearly shows the such coatings would be desirably used in multilayer curtain coating. (3) As to claim 42, the Examiner again notes that it is the combination of the references that provides the suggestion of a speed of over 200 m/min with the multilayer curtain with the claimed solids content. As discussed in section (2) above, the viscosities of Katagiri overlap with that taught by Wittosch, showing that layers of the viscosities formed by Wittosch can be acceptably used in multilayer curtain coating as well as single layer.

(B) As to applicant's arguments as to the rejections of claims 1, 3-6, 8-22, 24, 25, 27, 31, 34, 35, 37 and 42 using '828 in view of Wittosch and '810, the Examiner has reviewed applicant's arguments at pages 13-14 of the amendment, however, the rejection is maintained. (1) as to the argument that Konica ('810) is limited to curtains having very low solids contents, applicant's have made no showing as to this. While examples, which do not teach away from the broader teaching may show low solids content, '810, see the abstract, teaches that viscosities overlapping with that taught by the layers of Wittosch can be used, demonstrating the ability to acceptably use such layers. '810 uses viscosity to measure whether curtain coatings can be applied, not solids content. (2) As to the motivation to combine the references, the Examiner notes the discussion in

section (A) above as to the analogous nature or '828 and Wittosch. Moreover, '810 also demonstrates, that while it is used for photographic coatings, that the application of the coating can be beneficially improved through the control of the viscosity of the base layer and top layers, using viscosities overlapping that taught by Wittosch, and thus is reasonably pertinent to the problem of applicant. (3) as to the argument that a multilayer curtain having a solids content of at least 40% is not present in the references, while '828 at page 5 may indicate a preference of 5-25%, this is an option, not a requirement and as discussed above with regard to MPEP 2123 is not a teaching away from a broader disclosure. The Examiner has cited Wittosch as showing the known use of the claimed solids content in curtain coating, and the overlap of the viscosities of Wittosch with the acceptable viscosities for use in multilayer curtain coating shown by '810 clearly shows the such coatings would be desirably used in multilayer curtain coating. (4) As to claim 42, the Examiner again notes that it is the combination of the references that provides the suggestion of a speed of over 200 m/min with the multilayer curtain with the claimed solids content. As discussed in sections (2) and (3) above, the viscosities of '810 overlap with that taught by Wittosch, showing that layers of the viscosities formed by Wittosch can be acceptably used in multilayer curtain coating as well as single layer.

(C) As to applicant's arguments as to the rejections of claims 38, 39, 41 and 45-47 using '828 in view of Wittosch and Katagiri, and further in view of Dittman, the Examiner has reviewed applicant's arguments at pages 14-15 of the amendment,

however, the rejection is maintained. The Examiner has not cited Dittman as teaching a curtain coating process, the Examiner has cited Dittman as teaching the well known use of polyethylene oxide as a surfactant in multilayer coatings on slide dies, and further notes that '828 teaches the use of a surfactant in the curtain coating layers. Dittman is cited as to teaching surfactant that would be expected to be desirable for such use. As to the solids content of claim 41, and the viscosity of claim 47, these are suggested by the primary combination of references of '828 in view of Wittosch and Katagiri as discussed in section (A) above. As to Dittman teaching away from high viscosity interface layers, Dittman does not show the curtain coating process of the primary references, merely the well known use of the surfactant.

(D) As to applicant's arguments as to the rejections of claims 38, 39, 41 and 46-47 using '828 in view of Wittosch and '810, and further in view of Dittman, the Examiner has reviewed applicant's arguments at page 15 of the amendment, however, the rejection is maintained. The Examiner has not cited Dittman as teaching a curtain coating process, the Examiner has cited Dittman as teaching the well known use of polyethylene oxide as a surfactant in multilayer coatings on slide dies, and further notes that '828 teaches the use of a surfactant in the curtain coating layers. Dittman is cited as to teaching surfactant that would be expected to be desirable for such use. As to the solids content of claim 41, and the viscosity of claim 47, these are suggested by the primary combination of references of '828 in view of Wittosch and '810 as discussed in section (B) above. As to Dittman teaching away from high viscosity interface layers,

Dittman does not show the curtain coating process of the primary references, merely the well known use of the surfactant.

(E) As to applicant's arguments as to the rejections of claims 41 and 45 using '828 in view of Wittosch , '095 and Dittman, the Examiner has reviewed applicant's arguments at pages 15-16 of the amendment, however, the rejection is maintained. As to the argument that the speeds achieved by using the low viscosity bottom layer all require the use of a low solids curtain to achieve high velocities, the Examiner disagrees. '095, for example, makes no requirements as to the solids content of the upper layer, merely providing that the upper layers have "high viscosities", see column 4, lines 30-34 and column 5, lines 25-34. Such viscosities would overlap with that taught by the layers of Wittosch and thus such layers would be expected to work with the curtain coating process of '095. As to the argument that a multilayer curtain having a solids content of at least 40% is not present in the references, it is the combination of references that provides the rejection. For example, Wittosch teaches that the individual layers applied can all have solids wt% above 45%, and thus the total of these layers would also be above 45 solids wt%. Furthermore, Wittosch teaches that the layers can be applied by curtain coating. While specifically multilayer curtain coating is not taught, at the least it indicates that curtain coating layers can be provided and coated at that solids wt%. Wittosch also teaches relatively high viscosity layers of 250 cps-450 cps and also 40-75 cps. '095 teaches an advantageous way to coat high viscosity multilayered curtain coatings quickly using an accelerating layer, and one of ordinary

skill in the art would clearly see this applying to layers of the viscosity provided by Wittosch. Since the viscosity would be such that allowed for multilayer curtain coating, the solids wt% would not prevent such curtain coating.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (571) 272-1413. The examiner can normally be reached on M-F(6:00-3:30) with the First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone numbers for the organization where this application or proceeding is assigned are (571) 273-8300 for regular communications and for After Final communications.

Other inquiries can be directed to the Tech Center 1700 telephone number at (571) 272-1700.

Furthermore, information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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